

What is claimed is:

1. (Amended) A negative pressure air bearing slider, comprising:

a slider body for flying above a surface of a recording disc during relative rotation of the disc, the slider body having a principal surface for confronting the surface of the disc, said principal surface having a lead portion, a rear portion, a first side portion and a second side portion, wherein the lead portion is spaced upstream of the rear portion relative to a longitudinal direction of said slider body which is coincident with a tangential rotational direction of the recording disc, and wherein the first side portion is spaced from the second side portion relative to a lateral direction of said slider body;

first and second projections extending from said lead portion of said principal surface of said slider body to define first and second air bearing surfaces, said first and second air bearing surfaces spaced apart from each other in the lateral direction of said slider body;

a U-shaped projection extending from said principal surface of said slider body, said U-shaped projection including an arcuate front wall portion at least partially located between said first and second air bearing surfaces, said U-shaped projection further including first and second side wall portions extending from opposite ends of said arcuate front wall rearwardly toward said rear portion and outwardly toward said first and second side portions of said principal surface for defining a negative pressure cavity therein, said first and second wall portions terminating at said rear portion of said [principle] principal surface of said slider body for defining third and fourth air bearing surfaces, said third and fourth air bearing surfaces spaced apart from each other along said lateral direction of said slider body and spaced apart from said first and second air bearing surfaces along said longitudinal direction of said slider body; a fourth projection extending from said rear portion of said principal surface of said slider body, said fourth projection interposed between said third and fourth air bearing surfaces and generally aligned with said longitudinal direction of said slider body; and

a transducer mounted on a rear edge of said fourth projection for establishing pseudo contact with the disc surface while said slider body is flying above said disc surface.

2. The negative pressure air bearing slider as claimed in claim 1, wherein said U-shaped projection is axisymmetrical about a longitudinal axis of said slider body.

3. The negative pressure air bearing slider as claimed in claim 2, wherein said first and said second air bearing surfaces are symmetric about said longitudinal axis of said slider body.

4. The negative pressure air bearing slider as claimed in claim 2, wherein said first and said second air bearing surfaces are respectively longitudinally aligned with said third and fourth air bearing surfaces, and wherein said negative pressure cavity is centrally located between said air bearing surfaces.

5. The negative pressure air bearing slider as claimed in claim 1, wherein each of said first and said second air bearing surfaces include a tapered surface portion, the tapered surface portion tapering from each air bearing surface toward a lead edge of said slider body.

6. The negative pressure air bearing slider as claimed in claim 1, wherein each of said first and said second air bearing surfaces include a stepped down surface portion, the stepped down surface portion extending from each air bearing surface to a lead edge of said slider body.

7. The negative pressure air bearing slider as claimed in claim 1, wherein an interface region between said arcuate front wall portion and said first side wall portion includes a first stepped down surface portion extending between said third air bearing surface and an inner edge of said slider body, and wherein an interface region between said arcuate front wall portion and said second side wall portion includes a second stepped down surface portion extending between said fourth air bearing surface and an outer edge of said slider body.

8. The negative pressure air bearing slider as claimed in claim 1, wherein an interface region between said arcuate front wall portion and said first side wall portion includes a first stepped down surface portion extending between said third air bearing surface and said negative pressure cavity, and wherein an interface region between said arcuate front wall portion and said second side wall portion includes a second stepped down surface portion extending between said fourth air bearing surface and said negative pressure cavity.

9. The negative pressure air bearing slider as claimed in claim 8, wherein the interface region between said arcuate front wall portion and said first side wall portion further includes a third stepped down surface portion extending between said third air bearing surface and said negative pressure cavity, and wherein the interface region between said arcuate front wall portion and said second side wall portion further includes a fourth stepped down surface portion extending between said fourth air bearing surface and said negative pressure cavity.

10. The negative pressure air bearing slider as claimed in claim 1, wherein an elongated groove is provided in said arcuate front wall portion, said groove extending between said first and second side wall portions.

11. (Amended) The negative pressure air bearing slider as claimed in claim 1, wherein an opening is provided in said arcuate front wall portion, said opening located between said first and second side wall portions and extending to said principal surface of said slider body.

12. The negative pressure air bearing slider as claimed in claim 11, wherein said opening is offset from a longitudinal axis of said slider body.

13. The negative pressure air bearing slider as claimed in claim 11, wherein said opening is symmetrical about a longitudinal axis of said slider body.

14. The negative pressure air bearing slider as claimed in claim 10, wherein said elongated groove in said arcuate front wall portion is symmetrical about a longitudinal axis of said slider body.

15. The negative pressure air bearing slider as claimed in claim 10, wherein said elongated groove in said arcuate front wall portion is offset about a longitudinal axis of said slider body.

16. (Amended) A negative pressure air bearing slider, comprising:

a slider body for flying above a surface of a recording disc during relative rotation of the disc, the slider body having a principal surface facing the surface of the disc, said slider having a lead edge, a rear edge, a first side edge and a second side edge, wherein the lead edge is spaced upstream of the rear edge along a longitudinal axis of said slider body, the longitudinal axis coincident with a tangential rotational direction of the recording disc, and wherein the first side edge is spaced from the second side edge along a latitudinal axis of said slider body;

first and second projections extending from a lead portion of said principal surface adjacent to said lead edge to provide first and second air bearing surfaces, said first and second air bearing surfaces spaced apart from each other along said latitudinal axis and located proximal to said first and second side edges of said slider body such that a gap is provided therebetween;

a U-shaped projection extending from said principal surface of said slider body, said U-shaped projection including an arcuate front wall and first and second side walls extending from each end of said front wall, each of said side walls extending rearwardly toward said rear portion and outwardly toward an adjacent side edge of said slider body for defining a negative pressure cavity therein, a forwardmost portion of said arcuate front wall located at least partially between said first and second air bearing surfaces such that first and second passages are formed between the arcuate front wall and a rear edge of said first and second air bearing surfaces, said passages communicating with said gap to provide a flow path that extends from said lead portion and terminates along said side edges prior to reaching a rear portion of said slider body adjacent to said rear edge thereof, said first and second wall portions terminating at said rear portion of said slider body for defining third and fourth air bearing surfaces spaced apart along said latitudinal axis and located proximal to said first and second side edges of said slider body, the air bearing surfaces positioned about on said [principle] principal surface of said slider body such that four separate and distinct positive pressure areas are provided when said slider body is flying above said rotating disc; and

a fourth projection extending from said rear portion of said slider body, said fourth projection generally aligned with said longitudinal axis of said slider body, the fourth projection including a transducer mounted on a rear edge thereof for establishing pseudo contact with the disc surface while said slider body is flying above said disc.

17. The negative pressure air bearing slider of claim 16 wherein said forward most portion of said arcuate front wall is aligned generally with said longitudinal axis of said slider body.

18. The negative pressure air bearing slider of claim 16 wherein said negative pressure cavity is generally rounded.

19. The negative pressure air bearing slider of claim 16 wherein each of the passages of said flow path extend tangentially to said longitudinal axis of said slider body.

20. The negative pressure air bearing slider of claim 16 wherein each of the passages and said gap of said flow path coact to provide a wide flow path.

1 21. A negative pressure air bearing slider having a negative pressure cavity, comprising:

2 a slider having a body with a principal surface disposed to confront a recording surface of

3 a recording medium, said principal surface having a lead portion and a rear portion, said lead

4 portion being spaced upstream from said rear portion relative to a rotational direction of any

5 recording medium confronted by said slider, said lead portion having a front edge, said rear

6 portion having a rear edge, said front edge and said rear edge together defining boundaries of said

7 principal surface in a longitudinal direction of said slider body; and

8 a U-shaped air bearing platform defining a negative pressure cavity on said principal

9 surface, said U-shaped air bearing platform comprising a cross rail portion extending generally

10 laterally across said principal surface and first and second side wall portions extending from

11 opposite ends of said cross rail portion rearwardly toward said rear portion of said principal

12 surface and respectively terminating at a first rear termination and a second rear termination, at

13 least one of said first and second side wall portions having an arcuate portion;

14 at least one of said first rear termination and said second rear termination does not

15 coinciding with said rear edge, and being disposed upstream of said rear edge relative to said

16 rotational direction of said recording medium.

1 22. The negative pressure air bearing slider according to claim 21, further comprising:

2 a gap disposed within said cross rail portion.

1 23. The negative pressure air bearing slider according to claim 22, wherein:

2 said gap is centered with respect to a longitudinal axis of said slider body.

1 24. The negative pressure air bearing slider according to claim 22, wherein:

2 said gap is off-centered with respect to a longitudinal axis of said slider body.

1 25. The negative pressure air bearing slider according to claim 21, further comprising:

2 a recessed step disposed within said cross rail portion.

1 26. The negative pressure air bearing slider according to claim 25, wherein:

2 said recessed step is centered with respect to a longitudinal axis of said slider body.

1 27. The negative pressure air bearing slider according to claim 25, wherein:

2 said recessed step is off-centered with respect to a longitudinal axis of said slider body.

1 28. The negative pressure air bearing slider according to claim 21, further comprising:

2 a first front air bearing platform; and

3 a second front air bearing platform;

4 said first and said second front air bearing platforms being disposed on opposite sides of
5 said principal surface symmetrically about a longitudinal axis of said slider body, said first and
6 second front air bearing platforms being disposed upstream of said U-shaped air bearing platform

7 relative to a rotational direction of said recording medium.

1 29. The negative pressure air bearing slider according to claim 28, wherein:

2 a tapered surface portion is interposed between said front edge and each of said first and
3 said second front air bearing platforms, the tapered surface portion tapering from each air bearing
4 surface toward said front edge of said slider body.

1 30. The negative pressure air bearing slider according to claim 21, further comprising:

2 a rear air bearing platform accommodating mounting of a transducer, said rear air bearing
3 platform being spaced downstream of said U-shaped air bearing platform relative to a rotational
4 direction of said recording medium, and being centered with respect to a longitudinal axis of said
5 slider body.

1 31. A negative pressure air bearing slider, comprising:

2 a principal surface defining a first plane tangential to a direction of flight of said slider;
3 said principal surface having a lead portion and a rear portion, said lead portion being
4 spaced upstream from said rear portion relative to said direction of flight of said slider, said lead
5 portion having a front edge, said rear portion having a rear edge, said front edge and said rear
6 edge together defining longitudinal boundaries of said principal surface in said direction of flight
7 of said slider; and

8 a U-shaped air bearing platform having a plurality of air bearing surfaces defining a

9 second plane tangential to said direction of flight of said slider, said U-shaped air bearing
10 platform comprising first and second side wall portions extending from said lead portion
11 rearwardly toward said rear portion and respectively terminating at a first rear termination and a
12 second rear termination, at least one of said first and second side wall portions forming an
13 arcuate portion;

14 at least one of a surface between said first rear termination and said rear edge and a
15 surface between said second rear termination and said rear edge being in said first plane.

1 32. The negative pressure air bearing slider according to claim 31, wherein said U-
2 shaped air bearing platform further comprising:

3 a cross rail portion extending generally laterally across said principal surface.

1 33. The negative pressure air bearing slider according to claim 32, further comprising:
2 a gap disposed within said cross rail portion.

1 34. The negative pressure air bearing slider according to claim 33, wherein:
2 said gap is centered with respect to a longitudinal axis of said slider body.

1 35. The negative pressure air bearing slider according to claim 33, wherein:
2 said gap is off-centered with respect to a longitudinal axis of said slider body.

1 36. The negative pressure air bearing slider according to claim 32, further comprising:
2 a recessed step disposed within said cross rail portion.

1 37. The negative pressure air bearing slider according to claim 36, wherein:
2 said recessed step is centered with respect to a longitudinal axis of said slider body.

1 38. The negative pressure air bearing slider according to claim 36, wherein:
2 said recessed step is off-centered with respect to a longitudinal axis of said slider body.

1 39. The negative pressure air bearing slider according to claim 31, further comprising:
2 a first front air bearing platform; and
3 a second front air bearing platform;
4 said first and said second front air bearing platforms being disposed on opposite ends of
5 said principal surface symmetrically about a longitudinal axis of said slider body, said first and
6 second front air bearing platforms being disposed upstream of said U-shaped air bearing platform
7 relative to said direction of flight of said slider.

1 40. The negative pressure air bearing slider according to claim 39, wherein:
2 a tapered surface portion is interposed between said front edge and each of said first and
3 said second front air bearing platforms, the tapered surface portion tapering from each air bearing
4 surface toward said front edge of said slider body.

1 41. The negative pressure air bearing slider according to claim 21, further comprising:

2 a rear air bearing platform accommodating mounting of a transducer, said rear air bearing
3 platform being spaced downstream of said U-shaped air bearing platform relative to said
4 direction of flight of said slider, and being centered with respect to a longitudinal axis of said
5 slider body.

1 42. A negative pressure air bearing slider, comprising:

2 a slider having a body with a principal surface disposed to confront a recording surface of
3 a recording medium, said principal surface having a lead portion and a rear portion, said lead
4 portion being spaced upstream from said rear portion relative to a rotational direction of any
5 recording medium confronted by said slider with a longitudinal axis of said slider extending
6 between said lead portion and said rear portion defining a longitudinal direction of said slider and
7 forming a tangent to said rotational direction, said lead portion having a front edge, said rear
8 portion having a rear edge, said front edge and said rear edge together defining boundaries of said
9 principal surface in said longitudinal direction of said slider; and

10 a U-shaped air bearing platform defining a negative pressure cavity on said principal
11 surface, said U-shaped air bearing platform comprising an arcuately shaped cross rail portion
12 extending transversely across said principal surface and first and second side wall portions
13 extending from different opposite ends of said cross rail portion rearwardly toward said rear
14 portion of said principal surface and respectively forming a first air bearing surface terminating

15 said first side wall portion and forming a second air bearing surface terminating said second side
16 wall portion, at least one of said first and second side wall portions having an arcuate portion
17 with said cross rail portion comprising an arcuately shaped front wall oriented toward said lead
18 portion.

1 43. The negative pressure air bearing slider according to claim 42, further comprising a
2 gap disposed within said cross rail portion.

1 44. The negative pressure air bearing slider according to claim 43, wherein said gap is
2 centered with respect to said longitudinal axis of said slider body.

1 45. The negative pressure air bearing slider according to claim 43, wherein said gap is
2 off-centered with respect to said longitudinal axis.

1 46. The negative pressure air bearing slider according to claim 42, further comprising a
2 recessed step disposed within said cross rail portion.

1 47. The negative pressure air bearing slider according to claim 46, wherein said recessed
2 step is centered with respect to said longitudinal axis.

1 48. The negative pressure air bearing slider according to claim 46, wherein said recessed

2 step is off-centered with respect to said longitudinal axis.

1 49. The negative pressure air bearing slider according to claim 42, further comprising:

2 a first front air bearing platform; and

3 a second front air bearing platform;

4 said first and said second front air bearing platforms being disposed on opposite sides of
5 said principal surface symmetrically about said longitudinal axis of said slider body, said first
6 and second front air bearing platforms being disposed upstream of said U-shaped air bearing
7 platform relative to said rotational direction.

1 50. The negative pressure air bearing slider according to claim 49, further comprised of:

2 a tapered surface portion is interposed between said front edge and each of said first and
3 said second front air bearing platforms, the tapered surface portion tapering from each air bearing
4 surface toward said front edge of said slider body.

1 51. The negative pressure air bearing slider according to claim 42, further comprising a
2 rear air bearing platform accommodating mounting of a transducer, said rear air bearing platform
3 being spaced downstream of said U-shaped air bearing platform relative to a rotational direction
4 of said recording medium, and being centered with respect to said longitudinal axis of said slider
5 body.